


REMARKS

Claim 1 has been amended and claims 2-58 have been added to more accurately describe Applicant's invention. No new matter is presented by this Amendment. Entry of this amendment by the Examiner is respectfully requested per Rule 1.115.

A check for additional claim fees is attached. Authorization is given to charge payment of any additional fees required, or credit any overpayment, to Deposit Acct. 13-4213. A duplicate of this paper is enclosed for accounting purposes.

Respectfully submitted,

By:



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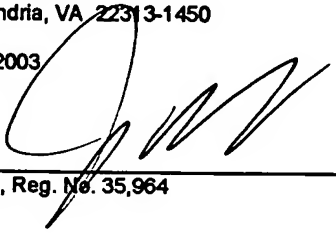


PATENT APPLICATION

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on January 21, 2003


Jeffrey D. Myers, Reg. No. 35,964

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant No. : 10/691,341
Applicant : Michael J. Renn
Filed : October 21, 2003
Title : Particle Guidance System

TC/A.U. : 2874
Antic. Examiner :

Docket No. : ODC-2003-2-NPA
Confirmation No. 6655

Commissioner for Patents
United States Patent and Trademark Office
PO Box 1450
Alexandria, Virginia 22313-1450

PRELIMINARY AMENDMENT

Sir:

Please amend the application, without prejudice, as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 8 of this paper.

Listing of Claims:

1. (currently amended): A method for depositing material on a substrate comprising the steps of:
 - a. ~~directing a stream of material toward the substrate, wherein the stream is substantially perpendicular to the substrate;~~
 - ~~b. applying a laser beam to the substrate, wherein said laser beam is substantially parallel to the stream of material.~~
 - a. entraining particles of the material within a stream of co-flowing fluid;
 - b. propelling the particles toward a substrate using the fluid; and
 - c. depositing the particles on a substrate.
2. (new): The method of claim 1 wherein the fluid comprises a gas.
3. (new): The method of claim 2 wherein the gas comprises air.
4. (new): The method of claim 1 wherein the entraining step comprises limiting lateral spreading of the particles.
5. (new): The method of claim 1 wherein the stream is substantially hollow.
6. (new): The method of claim 5 wherein the entraining step comprises forming a sheath or barrier around said particles.
7. (new): The method of claim 1 wherein the propelling step comprises propelling the particles at a velocity higher than achievable by optical propulsion.
8. (new): The method of claim 1 wherein the depositing step comprises precisely depositing the particles in desired locations on the substrate.

9. (new) The method of claim 1 further comprising the step of applying a laser beam to the particles.

10. (new): The method of claim 9 wherein the applying step occurs as the particles contact the substrate.

11. (new): The method of claim 9 wherein the applying step occurs after the particles contact the substrate.

12. (new): The method of claim 9 wherein the applying step occurs as the particles are being propelled by the fluid.

13. (new): The method of claim 9 wherein the applying step comprises modifying at least one property of the particles.

14. (new): The method of claim 9 wherein the applying step further comprises holding the particles in place on the substrate.

15. (new): The method of claim 1 wherein the fluid comprises a liquid.

16. (new): The method of claim 15 further comprising the step of modifying at least one property of the particles with the liquid.

17. (new): The method of claim 1 wherein the particles comprise liquid droplets.

18. (new): The method of claim 17 wherein the liquid droplets comprise a precursor.

19. (new): The method of claim 18 further comprising the step of processing the precursor to obtain a desired substance.

20. (new) The method of claim 18 further comprising the step of reacting the precursor with solids suspended in the droplets to obtain a desired substance.

21. (new): The method of claim 1 further comprising the step of immersing the particles in an immersion fluid.

22. (new): The method of claim 21 wherein the immersion fluid comprises a liquid.

23. (new): The method of claim 22 wherein the liquid comprises an aqueous liquid.

24. (new): The method of claim 21 wherein the fluid comprises a gas.

25. (new): The method of claim 24 wherein the gas comprises an inert gas.

26. (new): The method of claim 21 wherein the immersing step comprises modifying at least one property of the particles.

27. (new): The method of claim 1 wherein the particles comprise at least one item selected from the group consisting of metals, alloys, semiconductors, plastics, glasses, aerosols, solid precursors, liquid precursors, liquid droplets containing dissolved materials, liquid droplets containing colloidal particles, and liquid droplets containing suspensions.

28. (new): The method of claim 1 wherein the particles comprise biological material.

29. (new): The method of claim 28 wherein the biological material comprises living cells or tissue.
30. (new): The method of claim 29 further comprises the step of immersing the living cells or tissue in a liquid comprising nutrients necessary for growth and/or sustenance of the living cells or tissue.
31. (new): The method of claim 1 wherein the substrate comprises at least one item selected from the group consisting of semiconductors, plastics, metals, alloys, ceramics and glasses.
32. (new): The method of claim 1 wherein the depositing step comprises heating the substrate.
33. (new): A product selected from the group consisting of micron-size surface structures, electrical circuits, semiconductor chips, and micro-electronic-mechanical system (MEMS) devices made according to the method of claim 1.
34. (new): An apparatus for depositing material on a substrate comprising:
a supply of particles of the material; and
a fluid supply;
wherein fluid from the fluid supply propels the material to the substrate.
35. (new): The apparatus of claim 34 wherein the fluid comprises a gas.
36. (new): The apparatus of claim 35 wherein the gas comprises air.
37. (new) The apparatus of claim 34 wherein the material is propelled at a velocity higher than achievable by optical propulsion.

38. (new): The apparatus of claim 34 further comprising a laser beam.
39. (new): The apparatus of claim 38 wherein the laser beam modifies at least one property of the particles.
40. (new): The apparatus of claim 38 wherein the laser beam holds the particles in place on the substrate.
41. (new): The apparatus of claim 34 wherein the fluid limits lateral spreading of the particles.
42. (new): The apparatus of claim 34 wherein the particles comprise at least one item selected from the group consisting of metals, alloys, semiconductors, plastics, glasses, aerosols, liquid chemical droplets, solid precursors, liquid precursors, liquid droplets containing dissolved materials, liquid droplets containing colloidal particles, and liquid droplets containing suspensions.
43. (new): The apparatus of claim 34 further comprising a chamber comprising an immersion fluid which immerses the substrate.
44. (new): The method of claim 43 wherein the immersion fluid comprises a liquid.
45. (new): The method of claim 44 wherein the liquid comprises an aqueous liquid.
46. (new): The method of claim 43 wherein the immersion fluid comprises a gas.
47. (new): The method of claim 46 wherein the gas comprises an inert gas.

48. (new): The apparatus of claim 43 wherein the immersion fluid modifies at least one property of the particles.

49. (new): The apparatus of claim 43 wherein the particles comprise biological material.

50. (new): The apparatus of claim 49 wherein the biological material comprises living cells or tissue.

51. (new): The apparatus of claim 50 wherein the immersion fluid comprises nutrients necessary for growth and/or sustenance of the living cells or tissue.

52. (new): The apparatus of claim 34 wherein the substrate comprises at least one item selected from the group consisting of semiconductors, plastics, metals, alloys, ceramics and glasses.

53. (new): The apparatus of claim 34 wherein the fluid comprises a liquid.

54. (new): The apparatus of claim 53 wherein at least one property of the particles is modified by the liquid.

55. (new): The apparatus of claim 34 wherein the particles comprise liquid droplets.

56. (new): The apparatus of claim 55 wherein the liquid droplets comprise a precursor.

57. (new): The apparatus of claim 56 wherein the precursor is processed to obtain a desired substance.

58. (new) The apparatus of claim 56 wherein the precursor is reacted with the particles to obtain a desired substance.


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